

Title: Bucket Extension for Front Loaders

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Cross-Reference To Related Application

This application is based on and claims priority of provisional patent application number 60/441,505 filed January 21, 2003.

Background and Summary of the Invention

This invention is related to material moving equipment and more particularly to front loaders that have buckets attached to the front moveable arm.

Heavy equipment called "front loaders" is used for moving loose materials such as snow, sand, dirt, and bulk food products such as corn, wheat and related grains. These front loaders are generally rubber wheeled vehicles that can move over the roads and highways. At the front of the front loader is an arm that is hydraulically controlled. At the forward portion of the arm is mounted a bucket that receives and moves the loose material. The arm can be raised, lowered and tilted to control the position of the bucket.

In prior devices the bucket is a fixed width bucket. It cannot practically be wider than the permissible width allowed by state law to travel over the roads and highways. Otherwise, if the bucket were too wide it would make the vehicle unsafe to travel on the roads for fear of striking an approaching vehicle. This maximum width is generally eight feet. However, there are times that a bucket wider than eight feet is needed or is desired. For example, when clearing snow from parking lots or when trying to clear the road and adjacent shoulder, it would be desirable to have a bucket that is fourteen feet wide. This wider bucket clears a corresponding wider path, thus requiring fewer passes with the front loader to clear the same area.

Several attempts have been made in the past to solve the problem of supplying a vehicle with a front bucket and means to extend its width. For example U. S. Patent No. 5,129,169 issued to Aubichon discloses an attachment that increases the size of a bucket to increase the efficiency of snow removal. The attachment is secured to the bucket by

hooks attached to the upper edge of the bucket. The attachment increases the width of the bucket and directs the snow towards the bucket for removal.

U. S. Patent No. 5,655,318 issued to Daniels discloses a snowplow with a blade having pivoting end extensions that pivot outward from behind the blade to increase the overall width of the blade. Hinges and support members connect the extensions to the blade. The blade extensions are hydraulically operated to open them from behind the blade to their extended position. This is an expensive solution to the problem.

U.S. Patent No. 5,819,444 issued to Desmarais discloses a snowplow having a central blade and two moving blades hinged to the ends of the main blade. The two moving blades can be adjusted by power means so that their angle with respect to the main blade is adjustable.

U.S. Patent No. 5,894,689 issued to Turk discloses a side plate attachment that is mounted onto the sides of a snowplow blade. The side plates do not extend the width of the plow but are designed to enclose the plow to create a form of bucket.

U.S. Patent No. 6,298,585 issued to Boulet discloses a wing accessory mounted on each end of a bucket of a front end loader. The wing is hooked extending over the front edge of the bucket. There is a coupling for securing the accessory to the back side of the bucket. The wing is not pivotally connected to the main bucket and cannot be folded in front of the bucket to a closed position.

Applicant's invention solves the problem of providing a front loader with a bucket that has a standard width allowing the vehicle to legally and safely travel over the roads and highways, and yet provides a bucket that extends to a greater width when it is to be used for material moving. It also provides a front loader with an economical means of bucket extensions on both the left and right sides of the bucket by providing side buckets that are pivotally connected to the main bucket. The side buckets are pivotally connected to the main bucket. In their closed and stored position the bucket extensions are mounted in front of the main bucket. When they are extended, the side buckets pivot 180° about the pivot connection to the sides of the main bucket into an open operable position. Locking means are provided to lock the bucket extensions in the open position.

Thus it is an object of the invention to provide a vehicle for moving material with a main bucket and extension buckets at the side of the main bucket. It is a related object

to provide a vehicle that can legally travel over the roads and highways with the bucket extensions in a stored position, and can have the buckets extended to their open operable positions when they are needed to increase the width of the bucket area.

A related object is to provide a vehicle having bucket extensions that are easily moved between their stored position to their operable open position. Another object is to provide bucket extensions that are relatively inexpensive and easy to add to existing front loaders or similar equipment.

These and other objects and advantages will be apparent from the Description of the Drawings and Description of the Preferred Embodiment.

Description of the Drawings

Fig. 1 is a front perspective view of the front loader with the main bucket and a left side bucket extension and a right side bucket extension in the opened, operable position ready for use.

Fig. 2 is a right side view of the right side bucket extension in the closed, stored position.

Fig. 3 is a front view with portions removed of the left side bucket extension in the closed, stored position.

Fig. 4 is a rear view of the left side bucket extension being positioned in the open, operable position illustrating the locking mechanism.

Fig. 5 is side view of the hinge plate that mounts on the outer sidewall of the main bucket.

Fig. 6 is a left front perspective view of the left side bucket extension and hinge pin, with the right side bucket extension being a mirror image thereof.

Description of the Preferred Embodiment

Looking at Fig. 1, we can see in phantom a front loader 10 of conventional design. The front loader 10 travels on large rubber wheels 11 so that it is adapted for

roads, highways, parking lots and other paved surfaces. At the front of the front loader 10 is a front or forward facing main bucket 12 with an open front. The main bucket 12 is mounted to an arm 14 on the front loader 10. When facing the front loader 10, there is a left side bucket extension 16 and a right side bucket extension 18. The main bucket 12 has a width "w" of approximately eight feet. The left and right side bucket extensions 16, 18 are approximately 3 ½ feet wide, extending the overall width of the main bucket to approximately fourteen feet when the bucket extensions 16, 18 are in the open position as seen in Fig. 1.

Turning to Fig. 2, we see the right side view of the main bucket 12 and an inner sidewall 20 of the right side bucket extension 18. The right side bucket extension 18 is connected to the main bucket 12 by a hinge 22. The left side bucket extension 16 is connected to the main bucket 12 in the same manner as the right side bucket extension 18 and is illustrated in the closed position in Fig. 3.

Fig. 5 illustrates the hinge plate 24 in greater detail where it is seen that it is made up of a vertical portion 26 and a horizontal portion 28. The portions 26 and 28 can be made from a singular piece of steel or two pieces fastened together. There are additional supporting brackets 30, 32 mounted on the vertical portion 26. The supporting brackets 30, 32 assist in positioning and supporting the hinge plate 24 when it is mounted to the side 34 of the main bucket 12. There are bolt holes 36 that receive mounting bolts 38 to firmly attach the hinge plate 24 to the side 34. Welding the hinge plate 24 to the side 34 can also be used for additional strength. When the hinge plate 24 is mounted to the side 34, a plurality of hinge tubes 39 extend beyond the main bucket 12. Complementary hinge tubes 40 are located on the bucket extension so that all of the hinge tubes align with each other. A hinge pin 42 is inserted into the aligned hinge tubes 39, 40 to pivotally attach the extension buckets 16, 18 to the main bucket 12. The extension buckets are free to pivot about the hinge 22 from the closed position as seen in Figs. 2 and 3 to the open position of Fig. 1.

There is a locking mechanism to hold the bucket extensions 16, 18 in the open position once they are pivoted from the closed position to the open position. The locking mechanism is illustrated in Fig. 4. There is a locking tube 46 that is mounted on the rear of the main bucket 12. There are a pair of locking tubes 48, 50 on the rear edge of each

bucket extension 16, 18 that are disposed above and below the locking tube 46 when the bucket extensions 16 and 18 are pivoted to the fully open position. A locking pin 52 is placed through the aligned tubes 46, 48 and 50 to lock the bucket extensions 16, 18 in the open position.

Fig. 6 illustrates the left side bucket extension 16 with the right side bucket extension 18 being a mirror image. There is a base 54 with a front edge 56. The front edge 56 can be fitted with a scraper blade 57 for snow and ice removal, and can be replaced when worn out. The inner sidewall 20 is adjacent to the main bucket side when in the open position. There is an outer sidewall 58 opposite the inner sidewall 20. A back 60 encloses the rear of the bucket extension 16. There is an open front opposite the back 60.

To use the invention, the left and right side bucket extensions 16 and 18 are normally closed in front of the main bucket 12 as seen in Fig. 2. This is the closed position in which the bucket extensions 16, 18 are pivoted to be in front of the main bucket 12. The open front of the main bucket 12 faces the open front of the bucket extensions. This closed position is used during transporting the front loader to the place where it is to be used. The overall width of the front loader is within the limits allowed for transport on the highways. When the front loader arrives to where it is to be used, such as the parking lot to be plowed, the left side bucket extension 16 and right side bucket extension 18 are pivoted about the hinges 22 to their respective open positions such as seen in Fig. 1. Now the open front of the main bucket 12 faces in the same forward direction as the open fronts of the bucket extensions 16, 18. The locking tubes 46, 46 and 50 are aligned and the locking pin 52 is slid into the aligned locking tubes to lock the extension buckets 16, 18 in the open position. The front loader is then ready for use. When the plowing job is completed, the procedure is reversed and the extension buckets 16, 18 are pivoted back to the closed position.

Thus there has been provided extension buckets that pivotally attach to the main bucket on a front loader to extend the operational width of the bucket on a front loader that fully satisfies the objects and advantages set forth above. While the invention has been described in conjunction with a specific embodiment, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art in

light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications and variations as fall within the spirit and scope of the appended claims.